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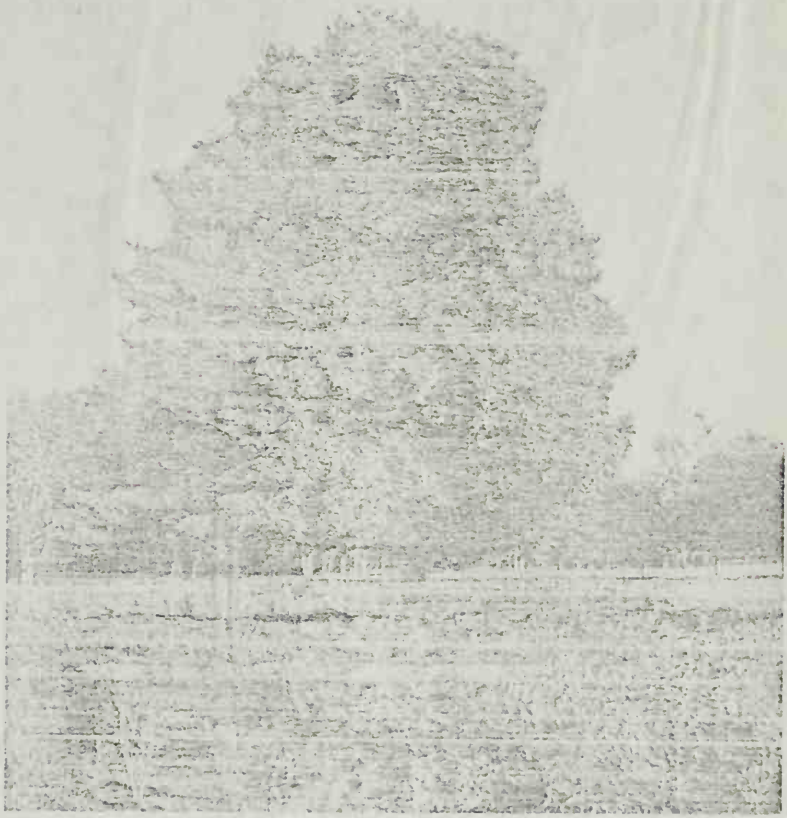
Hon. Thomas G. Murphy, Minister; W. W. Cory, C.M.G., Deputy Minister

FOREST SERVICE
E. H. FINLAYSON, Director of Forestry



Tree Pamphlet 14—Sugar Maple

F. A. ACLAND
Printer to the King's Most Excellent Majesty
OTTAWA
1930

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SUGAR MAPLE *Acer Saccharum*

Common names: Sugar maple, hard maple, rock maple, Canadian maple.
French names: Erable dur, érable à sucre, érable piqué, érable moiré, érable ondé.

The natural range of the sugar maple in Canada extends westward from the gulf of St. Lawrence and the Atlantic coast through the Maritime Provinces, southern Quebec, and Ontario to the lake of the Woods, but not north of the height of land dividing the watershed of the Great Lakes from that of Hudson bay.

The sugar maple is one of nine maples native to Canada. The other native species include the silver maple *(A. saccharinum)*, red maple *(A. rubrum)*, Manitoba maple *(A. Negundo)*, striped maple *(A. pennsylvanicum)*, mountain maple *(A. spicatum)*, broad-leaved maple *(A. macrophyllum)*, vine maple *(A. circinatum)*, and dwarf maple *(A. Douglasii)*. The three last-named are confined to British Columbia. The black maple *(A. saccharum*, variety *nigrum)* is considered by some botanists as a distinct species, and by others as merely a variety of the sugar maple.

Most forest trees are of ancient lineage, going back farther than the warm-blooded animals that furnished the stock from which humanity arose in the late Tertiary period. The maples are no exception; the oldest fossil remains of their leaves and twigs have been found in the Upper Cretaceous of Western Greenland and Western Canada. The number of maple species that existed during ancient times was probably greater than exists to-day.

HABIT AND CHARACTERISTICS

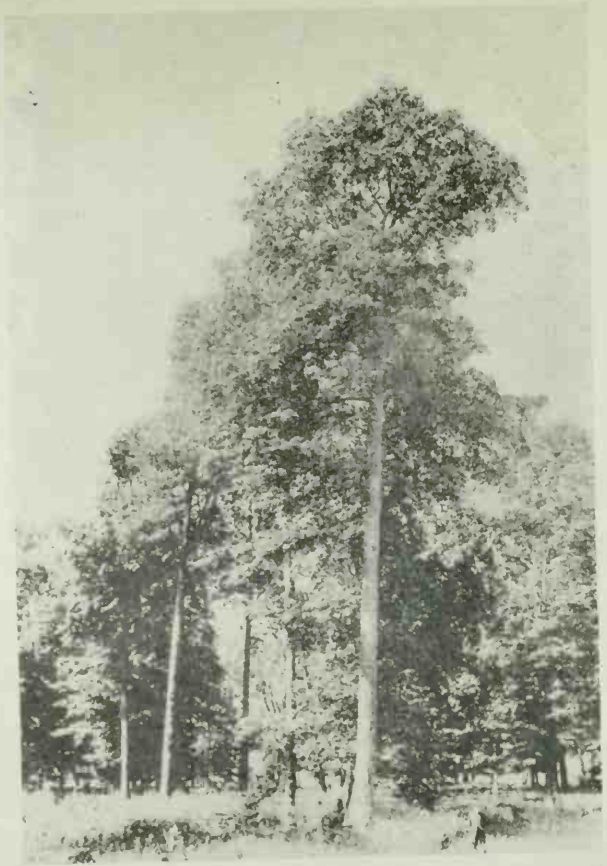
The mature sugar maple in the forest averages 80 to 90 feet in height, and 2 to 3 feet in diameter. It is one of the tallest American hardwoods, sometimes reaching the height of 130 feet, and the diameter of 5 feet.

The crown is spreading and dense unless crowded in a close stand. The root system is shallow.

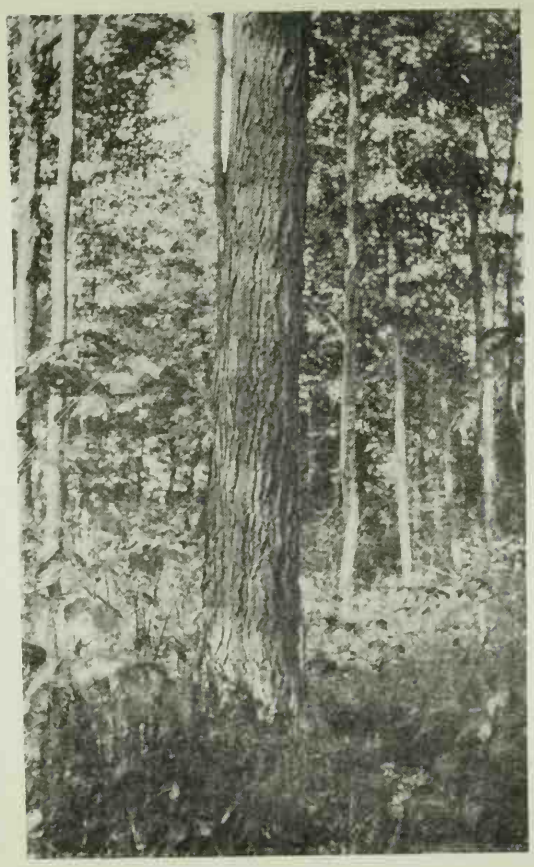
The bark on young trees is smooth and slightly furrowed. In older trees the bark is very rough, and its ridges tend to curl like a furrow turned in sod with a plough. This characteristic readily distinguishes the sugar maple from the silver and the red maples. On old trunks of the silver maple, the outer bark tends to peel off in long, thin strips which are more or less curled, free at either end, and attached to the trunk at the middle. The red maple bark also tends to crack and peel, but does not curl so markedly, being rather more flaky.

The leaves, as is the case with all maples, come out in pairs, one on each side of the stem. There are five main lobes. The open spaces or sinuses between the lobes are rounded and not terminated in a sharp point towards the stem, as with other maples of eastern Canada. The upper surface is dark green, and the under side lighter, but not so light in colour as in the case of the silver or white maple, a feature which gives the latter tree its name. In the autumn the sugar maple leaves turn crimson, scarlet, yellow, and orange in colour. The story is told that the chance dropping of a beautifully coloured leaf on the shoulder of the late Alexander Muir, then a school-teacher in Toronto, inspired him to write one of Canada's best known patriotic songs, "The Maple Leaf Forever".

The twigs, like the leaves, come out in pairs, one on each side of the branch, and are reddish-brown in colour. The winter buds are narrow, sharp-pointed and brown, a feature by which the tree is readily distinguished from the other native maples.



Forest Type of Sugar Maple



Typical Bark of Sugar Maple

The seeds are borne in clusters on drooping stalks. They are the familiar maple 'keys', with smooth plump seeds in pairs, each seed provided with a wing from one-half to one inch long. The wings are parallel or slightly divergent. The seed clusters of the sugar maple usually develop from the terminal buds of the twig, while those of the red maple and the silver maple are developed from lateral buds. They do not mature until autumn; those of the red and the silver maple, on the other hand, develop in early summer, and soon fall to the ground.

SIMILAR EXOTIC MAPLES

The sugar maple should not be confused with the Norway maple *(Acer platanoides)* and the sycamore maple *(Acer pseudoplatanus)*, both native to Europe but frequently planted in Canada for ornamental or shade purposes. The leaves of the Norway maple resemble those of the sugar maple, but are larger, firmer in texture, and a darker green in colour, some ornamental varieties showing a decidedly purplish colour in the early summer. The presence of a milky sap in the leaf stalk of the Norway maple readily distinguishes it from the sugar maple. The seed wings are also much more divergent in the case of the former tree. The leaves of the sycamore maple are less distinctly five-lobed than those of the sugar maple. Its keys develop in long pendulous racemes or chain-like clusters.

THE MAPLE AS AN ORNAMENTAL TREE

With its well-filled, rounded crown and its symmetrical and erect habit, the sugar maple is an ornament on a street. Few trees are more popular throughout Eastern Canada for street planting. In the early autumn it glows in brilliant yellow, orange, and red. Nor is all its beauty lost after the leaves drop, for its erect, shapely outline then stands out clearly, while the twigs and branches form a fine network against the sky. When spaced from forty to forty-five feet apart—to allow for free development when near maturity—and when properly pruned, it makes a low archway which gives to any street a pleasing perspective. Although very beautiful, the sugar maple foliage unfortunately is somewhat sensitive to dust and smoke, and the tree does not thrive in localities where such conditions are very marked.

THE MAPLE AS A SOURCE OF SUGAR

The sap of all the maples contains sugar, but in commercial practice, because of the higher percentage of sugar, only the sugar maple is tapped. A tree's annual yield varies from 4 to 35 gallons of sap, which contains from two to three per cent sugar. When boiled down, the average yearly yield per tree of the manufactured product is about one-half gallon of syrup or three pounds of sugar.

The Indians of Eastern Canada and the United States made sugar from the maple's sap, and from them the first settlers learned to do likewise. The primitive method was to gash the tree with an axe and catch the resulting sap-flow in wooden or bark troughs. The boiling down was done in large kettles suspended over open fires. Ashes, leaves, and bits of bark found ready entrance, and the resulting maple product was dark, strong-flavoured and variable in quality.

The early pioneers at first followed the Indian's crude method, but gradually improved upon it by using metal spigots inserted in a tree, to which were attached metal buckets with lids. The open kettles were replaced with specially designed evaporating pans, with the result that the maple products found on the market to-day are vastly improved in colour, flavour, and purity.

The maple syrup and sugar industry is organized on a commercial basis in Eastern Canada, particularly in the southeastern portion of Quebec. Approximately $5,500,000 worth of maple products are marketed each year.

THE WOOD: QUALITIES AND USES

The sapwood of the sugar maple is of a light yellowish colour, while the heartwood varies from light reddish-brown to brownish-white. The wood is strong, fine-textured, and hard. It takes a high polish. It seasons slowly, and, although liable to some checking, does not warp or twist. It is almost as strong as white oak, and stronger than red oak.

Sugar maple is probably used to a greater extent for hardwood flooring than for any other single purpose. Considerable quantities are also used for furniture, pianos, the framework of vehicles and agricultural implements, pulleys, washing machines, spindles, bobbins, tool handles, toys, rulers, skis, paddles, shoe-lasts, hat blocks, etc. It is also considered the best fuel-wood, being superior to beech, birch, or elm in that respect.

The peculiar curly or bird's-eye grain frequently revealed in the wood of the sugar maple makes it attractive for certain styles of furniture. This figure also appears, although less commonly, in soft maple, white ash, and yellow birch. There are numerous theories as to the cause of this grain on the wood. One explanation is that it is the result of sporadic or adventitious buds which never fully develop but remain dormant just beneath the bark; this explanation, although plausible, is not entirely satisfactory, since there is no indication of a core or pith which would be disclosed if the bird's-eyes resulted from such buds. Another theory ascribes the "bird's-eye" to the action of a parasitic fungus in the cambium layer. Whatever be the cause, the figure is due to the grain of the wood within a single "bird's-eye" being distorted in the form of a conical depression extending towards the centre of the tree.

ANNUAL CONSUMPTION AND PRESENT STAND

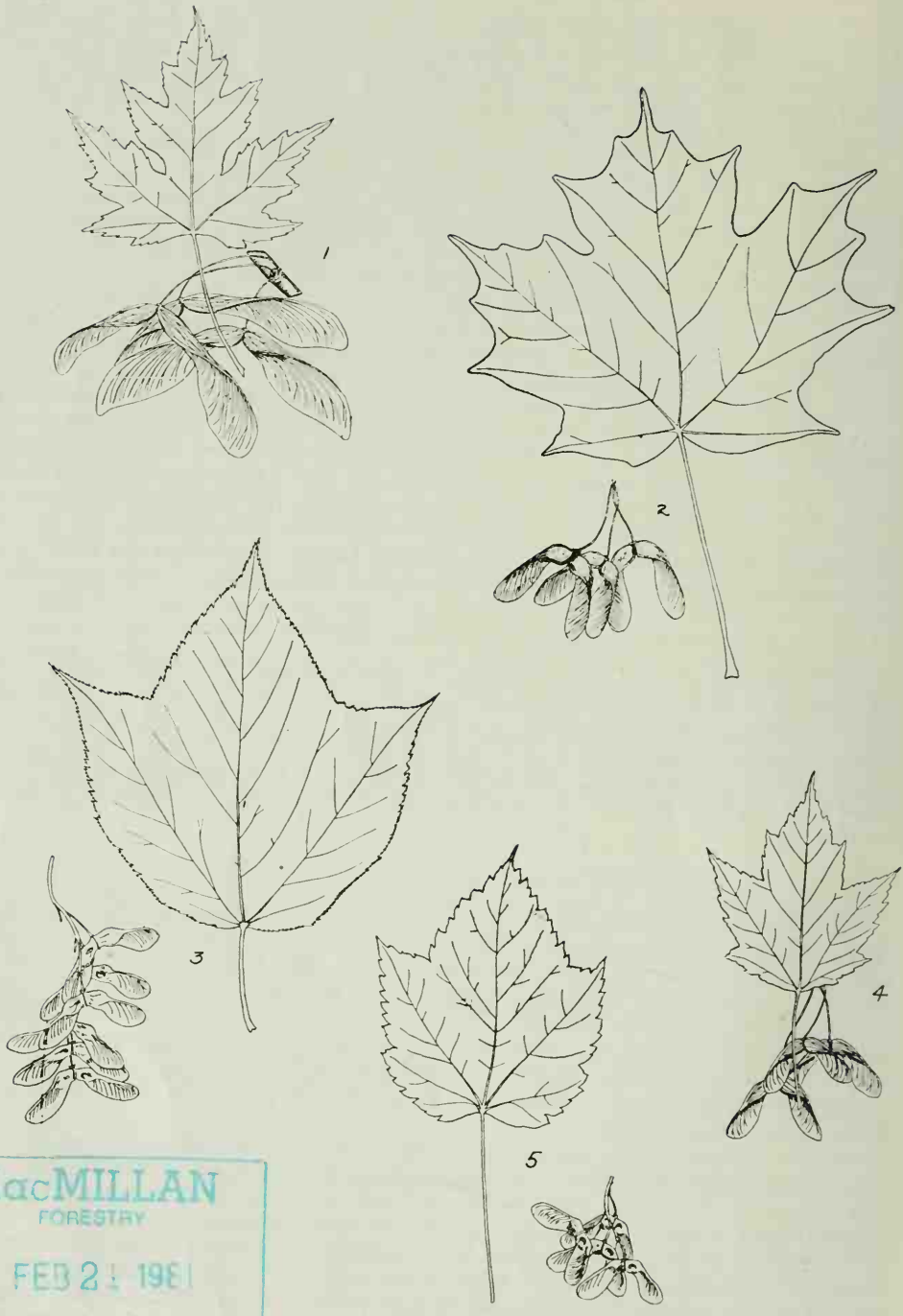
The average annual cut of maple is approximately 48,765,000 board feet. This figure does not include a large quantity used for fuel-wood. Although accurate figures are not available, it is estimated that the total remaining stand is approximately 3,100 million cubic feet, of which perhaps 85 per cent is sugar maple. Some 5,860 million board feet of this is of saw-material size, and the remainder is composed of 19 million cords of smaller-sized material suitable for fuel.

USE OF THE MAPLE LEAF AS A NATIONAL EMBLEM

The first official recognition of the maple leaf as a Canadian emblem was its appearance on the armorial insignia of the provinces of Quebec and Ontario which were granted by royal warrant on May 26, 1868. Long before this, however, it was looked upon as a national badge, particularly in the French-speaking parts of Canada, and there is little reason to doubt that its final adoption was the outcome of the very early practice in Lower Canada (Quebec) of using maple foliage to decorate streets and churches on festive occasions.

In this connection it is of interest to quote Mrs. Annie L. Jack, in "Maple Lore", published in 1900:

> "The leaf in its autumnal shading has long been Canada's cherished emblem, and there is now in the Chateau de Ramezay in Montreal a flag that was carried by patriots of 1837, on which is displayed a branch of nineteen maple leaves as part of its national characteristics. It was first proposed by Ludger Duvernay, founder of the St. Jean Baptiste Association, as its insignia, in 1833. Finally, it was adopted as the special emblem of Canadian nationality at a public dinner presided over by the Hon. Jacques Viger, then Mayor of Montreal, which was held in Mr. John McDonnell's garden, in St. Antoine Street, on the 24th June, 1834, and fresh leaves of the maple, taken from the trees, were worn by every guest".



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Maple Leaves and Fruit

1. Silver maple (*Acer saccharinum*). 2. Sugar maple (*Acer saccharum*).
3. Striped maple (*Acer pennsylvanicum*). 4. Red maple (*Acer rubrum*). 5. Mountain maple (*Acer spicatum*).

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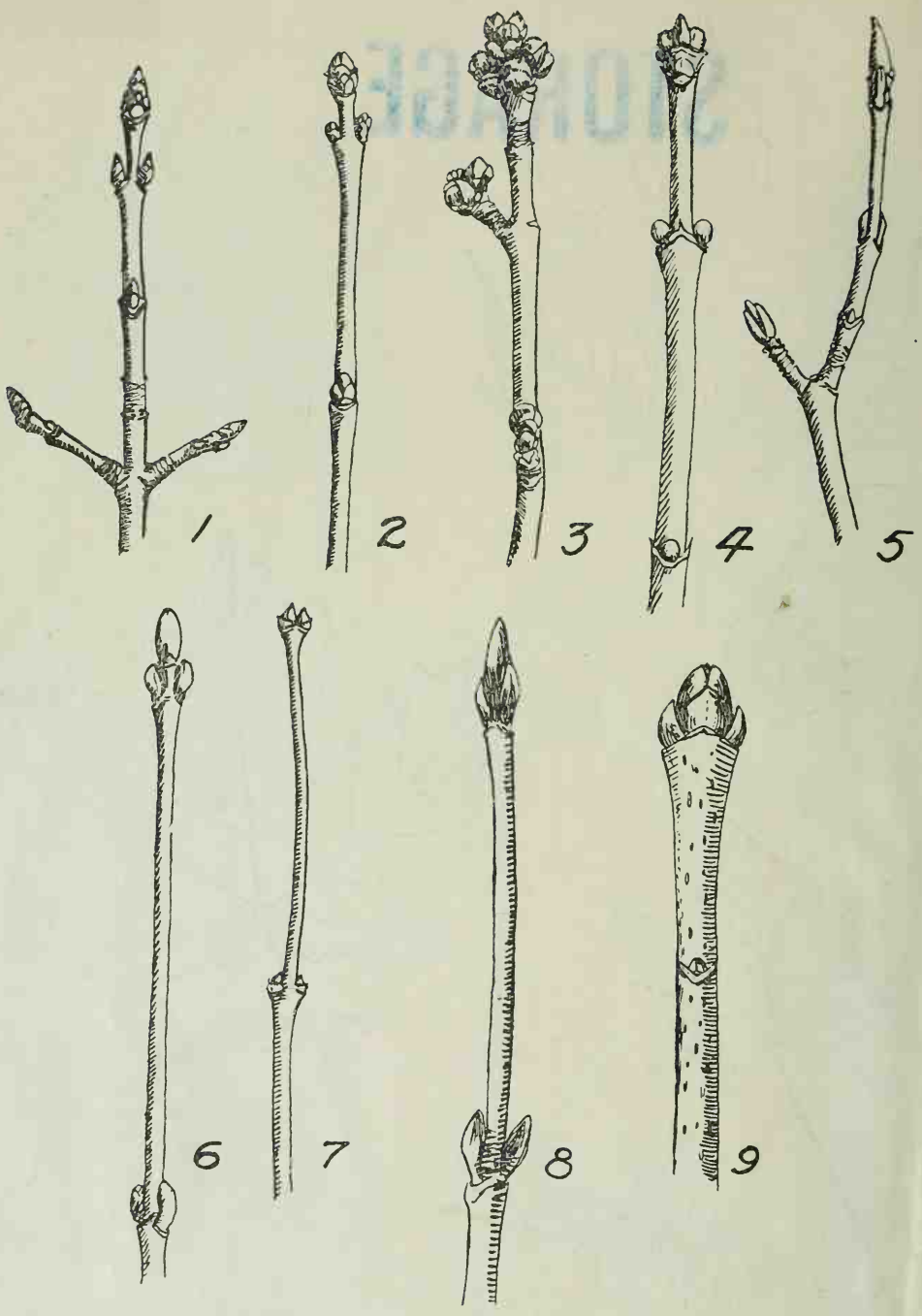
Maple Leaves and Fruit

6. Manitoba maple (*Acer Negundo*).
7. Vine maple (*Acer circinatum*).
8. Dwarf maple (*Acer Douglasii*).
9. Broad-leaved maple (*Acer macrophyllum*).



Maple Twigs

1. Sugar maple (*Acer saccharum*). 2. Red maple (*Acer rubrum*). 3. Silver maple (*Acer saccharinum*) 4. Manitoba maple (*Acer Negundo*). 5. Mountain maple (*Acer spicatum*). 6. Dwarf maple (*Ace Douglasii*). 7. Vine maple (*Acer circinatum*). 8. Striped maple (*Acer pennsylvanicum*). 9. Broad leaved maple (*Acer macrophyllum*).